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(54) Abstract Title

Billing arrangement for grouped users of a mobile telecommunications system

(57) A billing centre for a mobile communications system is provided which allows groups of subscribers sharing a single account to be identified both during the call rating procedure, during which call detail records are related to add a charge to the call detail record, and/or to add a usage of a pre-paid usage allocation to be added to the call detail records, and during the production of billing details at the end of a billing period.

A relational database holds usage allocation records which pertain either to a single subscriber, or to a group of subscribers. The group of subscribers may consist of any of 2 to 50, or more, subscribers, depending on the subscription type held by the group.

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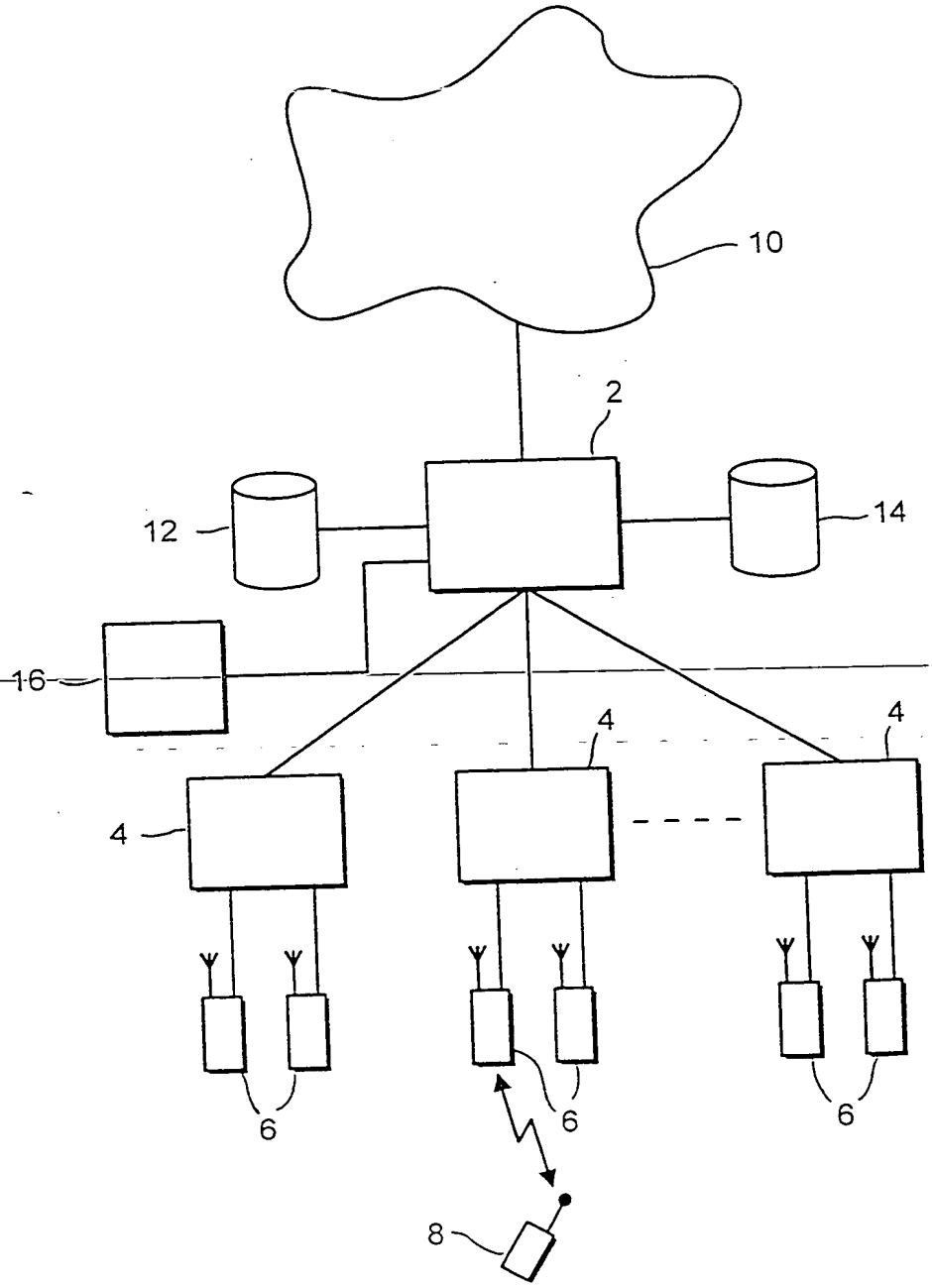

FIG. 1

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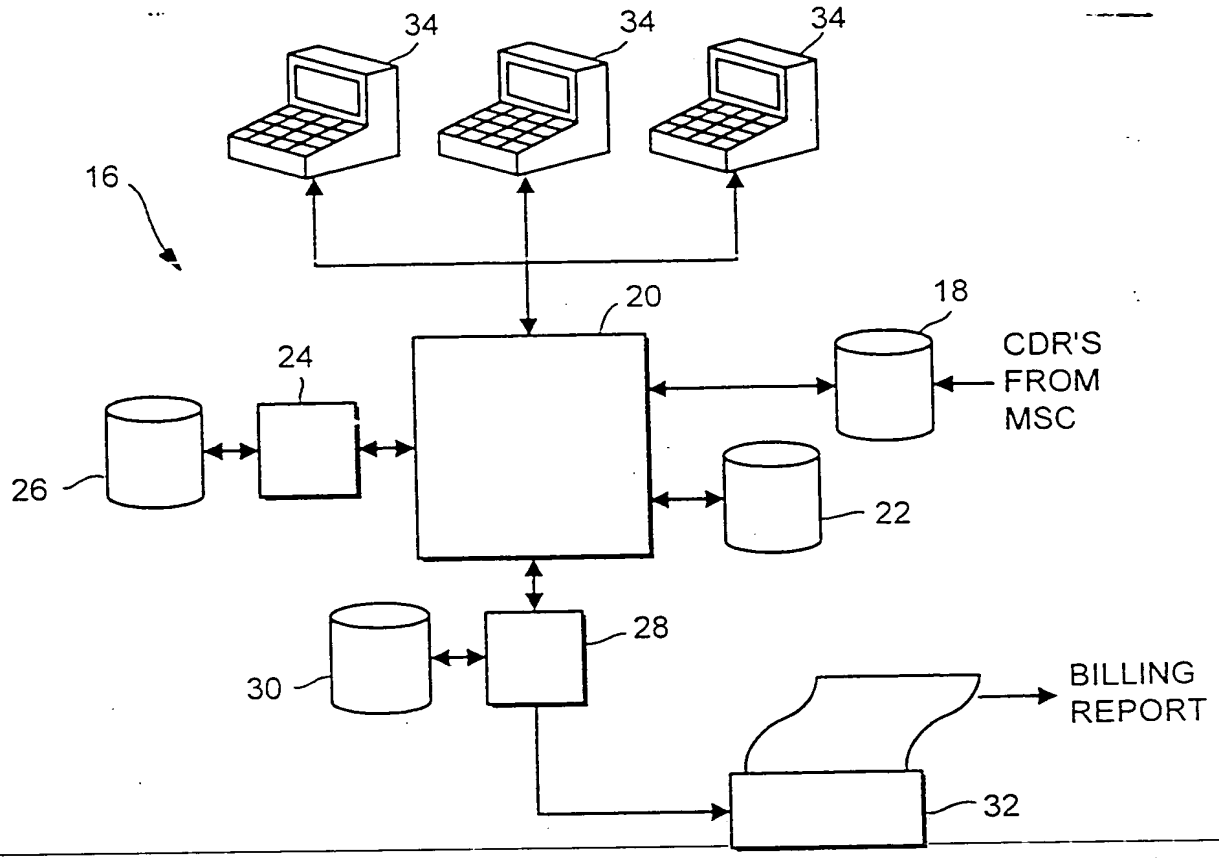
34
34
34
16
20
18
CDR'S
FROM
MSC
24
26
22
28
30
BILLING
REPORT
32

FIG. 2

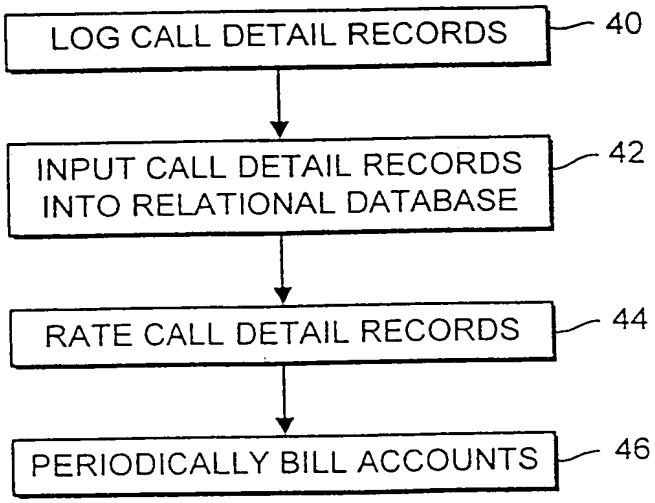
LOG CALL DETAIL RECORDS
40
INPUT CALL DETAIL RECORDS
INTO RELATIONAL DATABASE
42
RATE CALL DETAIL RECORDS
44
PERIODICALLY BILL ACCOUNTS
46

FIG. 3

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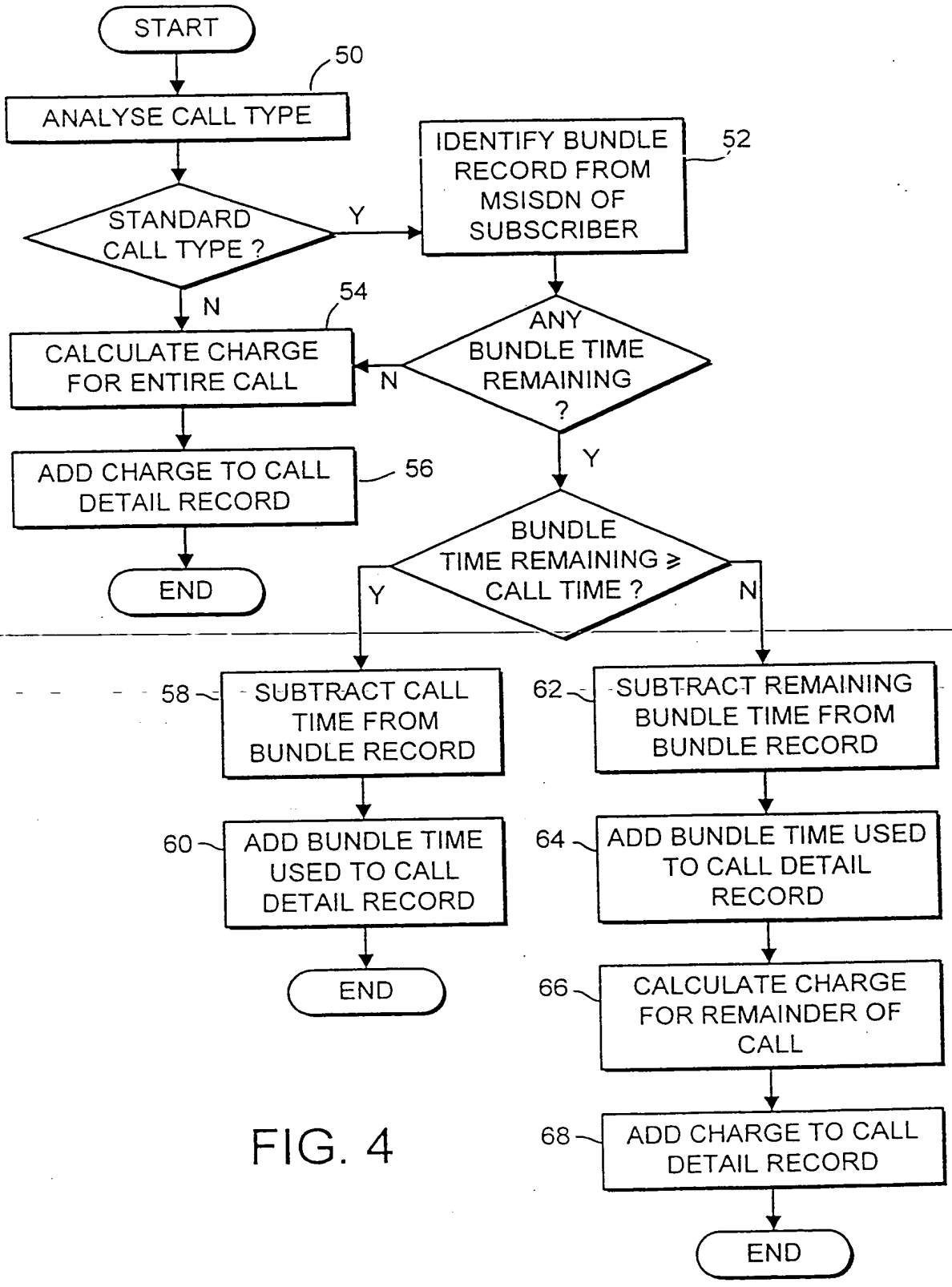
START
50
ANALYSE CALL TYPE
STANDARD CALL TYPE ?
Y
IDENTIFY BUNDLE RECORD FROM MSISDN OF SUBSCRIBER
52
N
54
CALCULATE CHARGE FOR ENTIRE CALL
ANY BUNDLE TIME REMAINING ?
N
Y
ADD CHARGE TO CALL DETAIL RECORD
56
END
BUNDLE TIME REMAINING ≥ CALL TIME ?
Y
N
58
SUBTRACT CALL TIME FROM BUNDLE RECORD
60
ADD BUNDLE TIME USED TO CALL DETAIL RECORD
END
62
SUBTRACT REMAINING BUNDLE TIME FROM BUNDLE RECORD
64
ADD BUNDLE TIME USED TO CALL DETAIL RECORD
66
CALCULATE CHARGE FOR REMAINDER OF CALL
68
ADD CHARGE TO CALL DETAIL RECORD
END

FIG. 4

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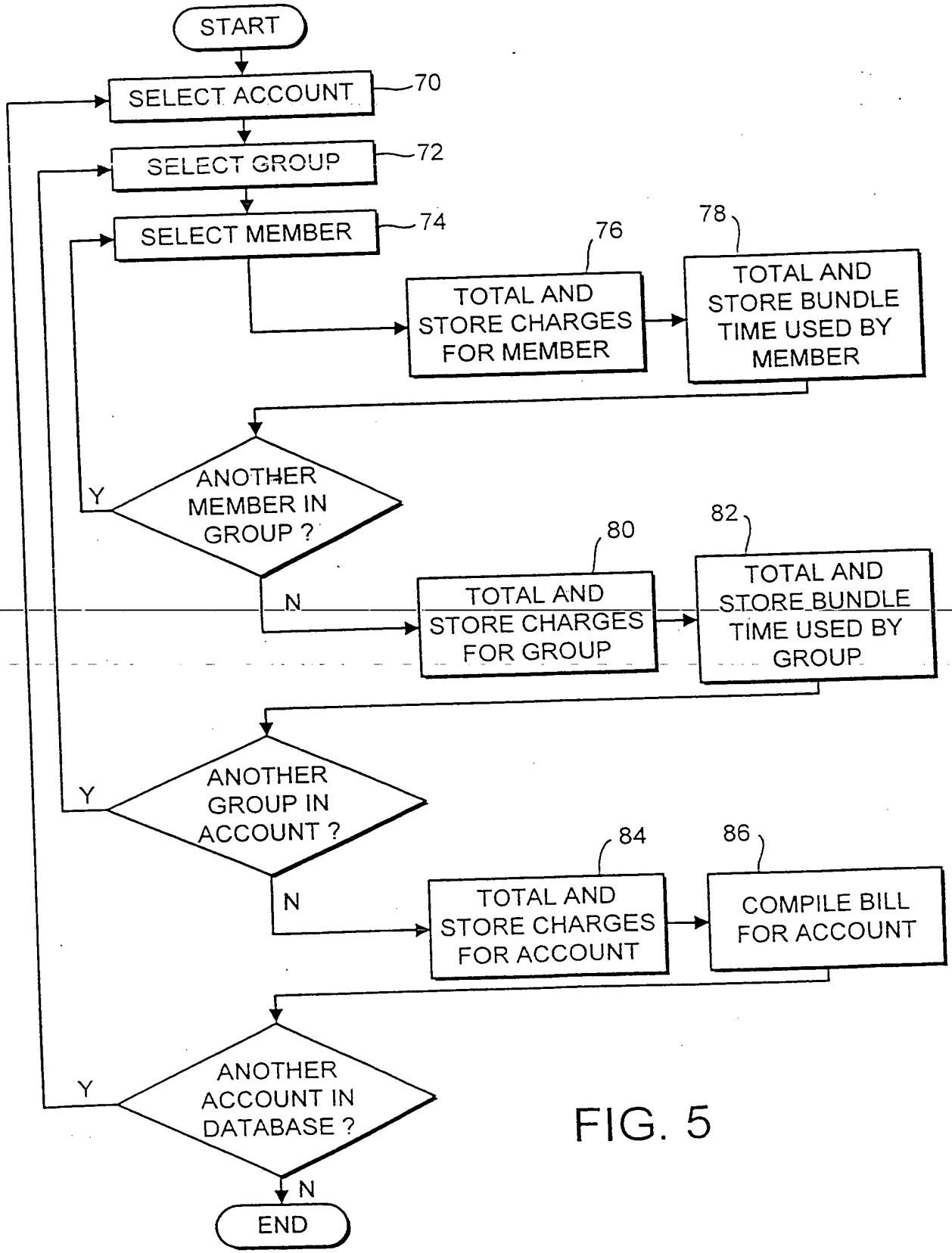
START
SELECT ACCOUNT
70
SELECT GROUP
72
SELECT MEMBER
74
76
TOTAL AND STORE CHARGES FOR MEMBER
78
TOTAL AND STORE BUNDLE TIME USED BY MEMBER
ANOTHER MEMBER IN GROUP ?
Y
N
80
TOTAL AND STORE CHARGES FOR GROUP
82
TOTAL AND STORE BUNDLE TIME USED BY GROUP
ANOTHER GROUP IN ACCOUNT ?
Y
N
84
TOTAL AND STORE CHARGES FOR ACCOUNT
86
COMPILE BILL FOR ACCOUNT
ANOTHER ACCOUNT IN DATABASE ?
Y
N
END

FIG. 5

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TELECOMMUNICATIONS

This invention relates to telecommunications, and in particular apparatus and methods for generating billing data for subscribers in a telecommunications system.

In mobile communications systems, such as cellular telephone networks, billing is conventionally carried out on a subscriber-by-subscriber basis. Herein, the term "subscriber" refers to the person authorised to access a mobile communications system, using a mobile station or a fixed station.

In a GSM system, when a subscriber utilises a mobile communications resource, such as conducting a voice call, sending a fax, retrieving voicemail messages, sending text messages, etc, a call detail record is produced in the network which is sent to a billing centre.

At the billing centre, the call detail records are logged on-line, and periodically transferred to an off-line billing system, for example on magnetic tapes. The call detail records are rated to attach a charge to each usage recorded in the call detail records. This charge depends on the type of service utilised, the length of a connection utilised, and may also depend on the particular type of subscription which the subscriber holds.

At the end of a billing period, for example at the end of each month, the rated call detail records are processed on a subscriber-by-subscriber basis

to produce an individual bill for each subscriber.

However, this conventional method of billing implemented in the billing centre is not particularly convenient for customers having multiple subscribers utilising the mobile communications system. It can be difficult to manage costings for a group of subscribers when individual bills are separately received.

United States patent number 4,979,207 proposes a cellular telephone billing system which processes call detail records of calls made by subscribers belonging to multiple-subscriber customers to produce bills. The call detail records are processed to attach a key identification number for each subscriber. The key identification number and a chosen associated information format are used to select a type of billing report required by the customer so that it may be provided during billing. However, this only provides a way to produce a desired format of billing report for a customer, and does not affect the charge made to a customer.

It would be desirable to provide apparatus whereby charging structures which are flexible, easy to understand, and logical, may be implemented for associated groups of subscribers in a mobile communications system.

In accordance with one aspect of the invention there is provided apparatus for generating billing data for subscribers in a telecommunications system, said apparatus comprising:

data storage means for holding subscriber records for a plurality of groups of subscribers, each of said groups comprising a plurality of subscribers for which a combined subscription is held, said groups comprising different numbers of subscribers; and

data processing means for analysing call data and applying one of a number of different predetermined call charging tariffs to a call made by a subscriber in one of said groups, in dependence on the group of which the subscriber is a member, in order to generate charging data for said call.

This aspect of the invention allows a common charging tariff to be applied for each subscriber in a group for which a combined subscription is held, for example by a business concern.

According to a further aspect of the invention there is provided apparatus for generating billing data for subscribers in a telecommunications system, said apparatus comprising:

data storage means for holding subscriber records for a plurality of groups of subscribers, each of said groups comprising a plurality of subscribers and said groups comprising different numbers of subscribers; and

data processing means comprising means for relating respective usage allocations to each said group, each said allocation being shared by subscribers in the related group.

This aspect of the invention provides apparatus whereby a usage

allocation may be allocated not only to a single subscriber, but by groups of subscribers of various sizes, thereby allowing flexibility and the utilisation of usage allocations in accordance with the desires of different groups of subscribers.

According to a yet further aspect of the invention there is provided apparatus for generating billing data for subscribers in a mobile communications system, said apparatus comprising:

data storage means for storing subscriber records and usage allocation records, said usage allocation records being shared by respective groups of subscribers, each said group comprising a plurality of subscribers; and

data processing means for analysing call data and reducing the usage allocation in a usage allocation record when said call data indicates that a subscriber in a group sharing said usage allocation record has made a call in the mobile communications system, such that said usage allocation record indicates the amount of said usage allocation remaining after said call.

Thus, by means of a common usage allocation record, the current amount of usage allocation remaining may be readily determined either during a billing period or at the end of a billing period.

According to a still further aspect of the invention there is provided apparatus for generating billing data for subscribers in a mobile communications system, said apparatus including data processing means

comprising:

first means for associating a shared allocation of usage with a group consisting of a plurality of subscribers; and

second means for processing call data and for reducing said shared allocation when said call data indicates that a call has been made by any of said plurality of subscribers in the group.

By sharing usage allocations, a given usage allocation can be more readily utilised in a given billing period, irrespective of fluctuations of usage by an individual subscriber in a group.

According to a further aspect of the invention there is provided apparatus for generating billing data for subscribers in a mobile communications system, said apparatus including data processing means comprising:

first means for selecting a billing account;

second means for allocating a plurality of groups of subscribers to said selected account;

third means for allocating a plurality of subscribers to each of said groups; and

fourth means for processing call data for each subscriber allocated to said billing account to generate said billing data for said account; said billing data including a total charge for said account and a total charge for each said

group.

Thus, a set of billing data for an account may be provided which sets out the charge not only for the account as a whole, but also for different groups of subscribers in the account, such as different departments of a business concern.

Further features and advantages of the present invention will be apparent from the following description of preferred embodiments of the invention, wherein:

Figure 1 is a block diagram schematically illustrating a mobile communications network in accordance with an embodiment of the invention;

Figure 2 is a block diagram schematically illustrating a billing centre in accordance with an embodiment of the invention;

Figure 3 is a flow diagram illustrating procedures carried out by the call billing centre of Figure 2;

Figure 4 is a flow diagram illustrating a call rating procedure carried out by the billing centre of Figure 2; and

Figure 5 is a flow diagram illustrating a billing procedure carried out in the billing centre of Figure 2.

Figure 1 shows a cellular communications network, such as a GSM network, which is in itself known and will not be described in detail. A mobile switching centre (MSC) 2 is connected via communications links to a

number of base station controllers (BSCs) 4. The BSCs 4 are dispersed geographically across areas served by the MSC 2. Each BSC 4 controls one or more base transceiver stations (BTSs) 6 located remote from, and connected by further communications links to, the BSC. Each BTS 6 transmits radio signals to, and receives radio signals from, mobile stations 8 which are in an area served by that BTS. That area is referred to as a "cell". A mobile communications network is provided with a large number of such cells, which are ideally contiguous to provide continuous coverage over the whole network territory.

The MSC 2 is also connected via communications links to other MSCs in the remainder of the communications system 10, and to a public services telephone network (PSTN), ISDN lines, etc, which are not illustrated. The MSC is provided with a home location register (HLR) 12 which is a database storing subscriber authentication data, and a visitor location register (VLR) 14 which is a database temporarily storing subscriber authentication data for mobile stations active in its area.

When the user of the mobile station 8 utilises a telecommunications service provided by the mobile communications network, for example by initiating a voice call, sending a fax, sending data, sending text messages, or retrieving voicemail, etc, a call detail record is generated in the network, which is sent to a billing centre 16.

The call detail records include, amongst other information, the international mobile subscriber identity (IMSI) and the telephone directory number (MSISDN) used for the call, along with data allowing the computation of a charge for the call. This data includes the date and time of the beginning of the call, its duration, the nature of the service provided during the call (voice, data, short messages, etc) the called party number, and in the case of packet services, the volume of transmitted data.

Table 1 illustrates a set of subscription types and charging structures which may be implemented in the billing centre 16 in accordance with this embodiment of the invention.

Subscription type	1st handset monthly charge	Monthly charge per additional handset	Number of users allowed	Shared bundle	peak n/min	off-pk n/min
1	N	N/2	1-2	60 mins	10n	5n
2	2N	N/2	1-3	200 mins	9n	4n
3	3N	N/2	1-4	360 mins	8n	4n
4	4N	N/2	1-5	540 mins	7n	3n
5	7N	N/2	1-10	1000 mins	7n	3n
6	18N	N/2	1-25	2500 mins	7n	3n
7	36N	N/2	1-50	5000 mins	7n	3n

As indicated, seven subscription types are provided having varying charging details. The charges shown are in cost units N and n for illustrative purposes.

Any number of subscribers (from a single subscriber to a group of 50, or more if desired) may be allocated to a single subscription, depending on the subscription type held. In each subscription type, a "bundle" of pre-paid call time usage allocation is provided for use during a single month. A monthly subscription charge is levied for the first subscriber according to the subscription type held, and a set monthly subscription charge is charged for every further subscriber added to the subscription. Subscribers pay call charges for non-bundle-time calls at peak times, and off-peak times, according to the subscription held.

From table 1, it will be apparent that the choice of a different subscription alters the characteristics of the subscription type as follows:

1. The monthly subscription charge for a single subscriber subscription generally increases.

2. The monthly subscription charge for a group subscription generally increases.

3. The number of subscribers allowed in a group subscription generally increases (from 2 to 50).

4. The bundle of pre-paid usage allocation (call time) generally increases.

5. The call charging tariffs, for both peak and off-peak calls, generally decrease.

It is also a feature of this embodiment of the invention that an account holder may have multiple subscriptions, including group subscriptions and/or individual subscriptions, in a single account managed by the billing centre 16.

Figure 2 illustrates features of the billing centre schematically. The billing centre includes a call detail record logging store 18, a relational database software application 20 and its associated data store 22, a call rating software application 24 and its associated tariff data store 26, a billing software application 28 and its associated subscription data store 30, and a billing report printing apparatus 32.

Each of the software applications 20, 24, 28 is implemented in an appropriate data processing means, such as a mainframe computer or a computer workstation. The data store 18 may consist of magnetic tape data storage, and/or other suitable storage media, such as hard disks.

Also connected to the relational database application 20 is a set of customer service workstations 34, allowing for on-line data input and retrieval of subscriber, group and account details from the relational database.

Figure 3 illustrates procedures carried out in the billing centre 16. The call detail records are received continually, in real time, from the MSC to which the billing centre is connected and logged in logging store 18, step 40. These logged call detail records are then periodically input in batches into the relational database 20/22.

The call detail records, once in the relational database 20/22, are then rated in date and time order by the rating application 24, referring to the tariff store 26 to attach an appropriate charge to each call detail record. The attached charge is stored in the relational database 20/22.

The relational database 20/22 holds not only call detail records but also subscriber detail records, bundle records (to be described below), group records and billing account records. The relational database holds subscriber data for each subscriber identifying the billing account to which the subscriber belongs, and if the subscriber is an individual subscriber, details identifying the subscription type which the subscriber holds, or if the subscriber belongs to a group, data identifying the group to which the subscriber belongs. The group records indicate the type of subscription held for the group. The relational database is configured so that any details relating to a billing account held in the database may be retrieved by selecting the appropriate billing account, any details relating to a group held on the database may be retrieved by selecting the appropriate group, and any details relating to a particular subscriber held in the database may be retrieved by selecting the appropriate subscriber.

Each bundle record is associated with a particular subscription, whether that is an individual subscriber subscription or a group subscription. Each bundle record holds data indicating an amount of pre-paid allocated call-time

usage (referred to as a call time "bundle" herein) allowed for the subscription during each billing period, and data indicating the amount of that usage allocation remaining during a billing period. In this embodiment of the invention, the usage allocation is a duration of call time. In the case of a single-subscriber subscription, the bundle is related to a single directory number (MSISDN) and may be used by that subscriber only. In the case of a group subscription, the bundle is related to a number of directory numbers (MSISDNs) and may be used by any subscriber in the group in part or in whole.

In this embodiment no charges are made by the network operator made for usage of the bundle time, and therefore it is desirable for subscribers to utilise all of their bundle time during a billing period.

Figure 4 illustrates the rating procedure carried out by the rating application 24 for a single call detail record. The call detail record is first analysed to determine whether the call made is of a standard call type, step 50. For example, standard calls may include national fixed-line terminating calls, whereas calls made to other mobile stations, premium rate services or international calls will be treated as non-standard, since they are generally more costly.

If the call type indicated in the call detail record is non-standard, the rating application 24 proceeds to calculate a charge for the entire call, by

retrieving non-standard tariff charging details held in the tariff store 26, step 54. When the charge has been calculated, data indicating the charge is added to the call detail record, 56, to allow the call to be billed at a later stage.

If in step 50 the call is identified as a standard call type, it is determined that the call duration may be subtracted from any available bundle time, rather than being charged for directly. In order to identify the bundle record holding the appropriate usage allocation data, the rating application 24 determines the directory number (MSISDN) from which the call was conducted, whereby the bundle record is identified by association in the relational database 20/22, step 52.

If the bundle record indicates that all of the bundle time originally available at the start of the billing period has been used already, the rating application 24 proceeds to retrieve data indicating the subscription type of the subscriber from the relational database 20/22 and standard tariff charges for that subscription type from the tariff store 26, and thereby to calculate the charge for the entire call, step 54. The calculated charge is added to the call detail record, step 56.

If however there is bundle time remaining, it is checked whether the bundle time remaining is greater than or equal to the duration of the call. If so, the duration of the call is subtracted from the remaining bundle time in the bundle record, step 58, and data indicating the bundle time used is added to

the call detail record, step 60, for use in subsequent billing of the call. No charge is attached to the call detail record.

If the bundle time remaining is less than the duration of the call, the remaining bundle time is subtracted from the remaining usage allocation in the bundle record (then no usage allocation remains) and data is added to the call detail record indicating the bundle time subtracted, steps 62 and 64.

Next, the charge for the remaining duration of the call is calculated by retrieving the subscription type held in the relational database 20/22, and the appropriate standard charging tariff details held in the tariff store 26, step 66. Data indicating the charge to be levied is then added to the call detail record, 68, for use during subsequent billing of the call.

At the end of a billing period, all of the call detail records pertaining to calls conducted during the billing period are stored in rated form on the relational database 20.

Figure 5 illustrates the procedure followed by the billing application 28 at the end of each billing period in order to generate billing data to be transmitted to the billing report printing apparatus 32.

First, the billing application 28 selects an account in the relational database 20/22, step 70, and the first group of subscribers in that account is selected in step 72. The first subscriber in the selected group is selected in step 74.

For the selected member, the billing application 28 retrieves each of the call detail records held in relational database 20/22 for the preceding billing period in turn and totals the charges to be billed for that subscriber using the charge data added to each call detail record by the rating application 24, and by totalling the periodic subscription charge indicated by the subscription data held in the relational database 20/22, using the subscription charge store 30, step 76.

The billing application 28 also totals the bundle time used by the subscriber during the preceding billing period, as indicated by the data added to the subscriber's call detail records by the rating application 24, step 78. The billing application stores data indicating the charge to be billed for that subscriber and the amount of bundle time used by the subscriber.

The billing application 28 then proceeds to perform steps 74, 76 and 78 for each subscriber in the selected group, until charging and bundle time data has been totalled for each subscriber in the selected group. Then, the charges stored for each subscriber in the group are totalled and data indicating the total charge for the group is stored, step 80, and the bundle time used by each subscriber is totalled and data indicating the total bundle time used by subscribers in the group is stored, step 82. The procedure returns to step 72 if the account consists of a number of groups, until there are no more groups remaining in the account.

Next, the total group charges calculated in step 80 are totalled and a total charge for the account is calculated and stored, step 84.

In step 86, the billing details for the account are compiled, using the charges and bundle times calculated by the billing application 28, and using other data in the call detail records retrieved by the billing application 28. The billing details include the subscription charges levied, the usage charges incurred, and the amount of the subscriber's group's allocation of bundle time used, for each subscriber in the account, the total subscription charges levied, the total usage charges incurred, and the total usage allocation used by each group, the total charge to be posted to the account, and individual call itemisation details indicating the date, time, duration, cost and terminating point for each call made by subscribers in the account during the preceding billing period.

Once the billing details have been compiled for an account, the billing details may be transmitted to the billing report printing apparatus, 32. The billing report printing apparatus 32 formats the billing details to generate an invoice for the account on one page, a group billing report on one or more further pages, and an individual call itemisation report on one or more further pages. The invoice specifies the total charges for the account to be paid by the account holder. The group billing report indicates for each group in the account the total subscription charges incurred for the group and the total

bundle time used by the group, along with the total subscription charges and the total bundle time used by each subscriber in the group. This allows the account holder to readily understand the charges incurred by each group in the account. The individual call itemisation report shows the date, time, duration, charge and terminating point for each call made by every subscriber in the account.

The embodiment of the present invention described provides a billing apparatus, in the form of a billing centre, for example similar to that shown in Figure 2, whereby charging structures allowing associated groups of subscribers belonging to the same account, and consisting of various numbers of subscribers, to be allocated collective charging tariffs, and/or a shared allocation of pre-paid usage. Furthermore, by calculating the usage allocation for each group actually used by each subscriber in a group, and by the group as a whole, during a billing period, and indicating those figures in the billing report generated for an account holder, the account holder is readily able to monitor the usage of the pre-paid allocations for groups in the account. In case the account holder finds that one or more groups of subscribers in the account are not using their subscription effectively, the account holder can ask the network operator to transfer the group to a different subscription type.

It is to be mentioned that the elements of the billing centre illustrated in Figure 2 need not be located at a single centre. For example, the billing

data produced by the billing application 28 may be transferred to magnetic tapes and transported to a printing centre for printing by the billing report printing apparatus 32.

A billing centre for a mobile communications system is provided which allows groups of subscribers sharing a single account to be identified both during the call rating procedure, during which call detail records are related to add a charge to the call detail record, and/or to add a usage of a pre-paid usage allocation to the call detail records, and during the production of billing details at the end of a billing period.

A relational database holds usage allocation records which pertain either to a single subscriber, or to a group of subscribers. The group of subscribers may consist of any of 2 to 50, or more, subscribers, depending on the subscription type held by the group.

In the case of subscriptions being taken through a service provider, rather than the network operator, the call detail records held in the relational database 20/22 for the proceeding billing period, once rated, may be sent to the service provider for processing using a billing application belonging to the service provider. Alternatively, the billing details may be generated by the billing application 28, and the billing details transmitted to the service provider for the production of billing reports by the service provider.

In the embodiment described above, the usage allocation consists of a

call time bundle. However, other usage allocations may be provided, such as a bundle consisting of a number of emergency calls, a number of pages of fax transmission, an amount of data, etc. Furthermore, the usage allocation need not be pre-paid in entirety - the bundle resource used may for example be charged at a reduced tariff.

It will also be appreciated that various other modifications and variations may be employed in relation to the above-described embodiment without departing from the spirit or scope of the present invention.

CLAIMS:

1. Apparatus for generating billing data for subscribers in a telecommunications system, said apparatus comprising:

data storage means for holding subscriber records for a plurality of groups of subscribers, each of said groups comprising a plurality of subscribers for which a combined subscription is held, said groups comprising different numbers of subscribers; and

data processing means for analysing call data and applying one of a number of different predetermined call charging tariffs to a call made by a subscriber in one of said groups, in dependence on the group of which the subscriber is a member, in order to generate charging data for said call.

2. Apparatus according to claim 1, wherein said storage means is for holding billing account records, each of said groups being associated with a respective billing account, and said processing means is for generating a combined billing report for each said billing account.

3. Apparatus according to claim 1 or 2, wherein said processing means is for relating a shared usage allocation to subscribers in one of said groups.

4. Apparatus according to claim 1 or 2, wherein said shared usage allocation is an allocation of call time which may be used in part of in whole by any of the subscribers in the group.

5. Apparatus according to claim 3 or 4, wherein said processing means is for reducing said allocation of usage when said call data indicates that a subscriber in said group has made a call.

6. Apparatus according to claim 5, wherein said processing means is for analysing said call data to determine whether said call falls within predetermined call type criteria, and for reducing said allocation of usage when those criteria are met, providing any of said allocation remains.

7. Apparatus according to claim 5 or 6, wherein said processing means is for processing said call data to generate billing data indicating the total amount of said allocation of usage used by said subscribers in said group during a billing period.

8. Apparatus for generating billing data for subscribers in a telecommunications system, said apparatus comprising:

data storage means for holding subscriber records for a plurality of

groups of subscribers, each of said groups comprising a plurality of subscribers and said groups comprising different numbers of subscribers; and

data processing means comprising means for relating respective usage allocations to each said group, each said allocation being shared by subscribers in the related group.

9. Apparatus according to claim 8, wherein said usage allocations are each allocations of call time which may be used in part or in whole by any of the respective subscribers in the related groups.

10. Apparatus according to claim 8 or 9, wherein said processing means is for processing call data to reduce one of said usage allocations for a call made by any of the subscribers in the related group.

11. Apparatus according to claim 10, wherein said processing means is for analysing said call data to determine whether said call falls within predetermined call type criteria, and for reducing said usage allocation when those criteria are met, providing any of said allocation remains.

12. Apparatus according to claim 10 or 11, wherein said processing means is for processing said call data to generate billing data indicating the

total amount of the group's usage allocation actually used by subscribers in said group during a billing period.

13. Apparatus according to any of claims 8 to 12, wherein said usage allocations have varying magnitudes.

14. Apparatus according to claim 13, wherein a plurality of group types are defined, different said magnitudes being allocated to different group types and the number of subscribers allowed in a group being dependent on the group type.

15. Apparatus according to claim 13 or 14, wherein the number of subscribers allowed in a group generally increases with the magnitude of the group's usage allocation.

16. Apparatus according to any preceding claim, wherein said telecommunications system is a mobile communications system.

17. Apparatus for generating billing data for subscribers in a mobile communications system, said apparatus comprising:

data storage means for storing subscriber records and usage allocation

records, said usage allocation records being shared by respective groups of subscribers, each said group comprising a plurality of subscribers; and

data processing means for analysing call data and reducing the usage allocation in a usage allocation record when said call data indicates that a subscriber in a group sharing said usage allocation record has made a call in the mobile communications system, such that said usage allocation record indicates the amount of said usage allocation remaining after said call.

18. Apparatus according to claim 17, wherein the processing means reduces the usage allocation in the same resource allocation record when said call data indicates that a different subscriber in the same group has made a call in the mobile communications system.

19. Apparatus according to claim 18, wherein the processing means attaches data indicating the amount of said reduction in usage allocation to the call data when the call data is processed.

20. Apparatus according to any of claims 17 to 19, wherein said processing means identifies a usage allocation record associated with a subscriber by means of a subscriber identity number indicated by said call data.

21. Apparatus according to claim 20, wherein said subscriber identity number is a telephone directory number, such as an MSISDN.

22. Apparatus for generating billing data for subscribers in a mobile communications system, said apparatus including data processing means comprising:

first means for associating a shared allocation of usage with a group consisting of a plurality of subscribers; and

second means for processing call data and for reducing said shared allocation when said call data indicates that a call has been made by any of said plurality of subscribers in the group.

23. Apparatus according to claim 22, wherein said second means is for reducing said shared allocation only when said call data indicates that a call falling within predetermined call type criteria has been made.

24. Apparatus for generating billing data for subscribers in a mobile communications system, said apparatus including processing means comprising:

first means for selecting a billing account;

second means for allocating a plurality of groups of subscribers to said

selected account;

third means for allocating a plurality of subscribers to each of said groups; and

fourth means for processing call data for each subscriber allocated to said billing account to generate said billing data for said account; said billing data including a total charge for said account and a total charge for each said group.

25. Apparatus according to any preceding claim, further comprising means for printing billing reports using said billing data.

26. Apparatus, or a method, substantially as hereinbefore described, in particular with reference to the accompanying drawings.

The Patent Office

27

Application No: GB 9805567.6
Claims searched: 1 to 26

Examiner: Jared Stokes
Date of search: 21 July 1998

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Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

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H04Q (7/22S)

Other: On-Line - WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X,Y	US 5 359 642	(IIC) See whole document, especially column 16 line 43 to colum 18 line 8	X: 8,17,22 at least Y: 1,24 at least
Y	US 4 979 207	(Motorola) See whole document	1,24 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

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